CHAPTER IV
RESULT AND DISCUSSION

4.1. Descriptive Statistics of Research Data

The data in this research used panel data. Panel data is a combination of time series data and cross-section data. The time-series data in this study are 6 years, namely 2013 to 2018. While the cross-section data in this study is the data of 34 Provinces in Indonesia. The data is secondary data taken from the Central Statistics Agency (BPS) and the directorate general of financial balance (DJPK). In this study the dependent and independent variables are used. The dependent variable in this study is GRDP based on 2010 constant prices in every province in Indonesia as the focus indicator for economic growth, while the independent variables consist of government expenditure, Human Development Index (HDI), worker, and investment. Indonesia is a country that has very abundant natural resources, both on land such as gold, silver, copper, forest products, etc. as well as at the seas such as fish, oil, and others. Even so, most of the people of Indonesia are still categorized as middle-lowers.

Based on the Table 4.1, it is shown that within six years all variables namely the gross regional domestic product (GRDP), government spending, Human Development Index (HDI), workers and investment of Indonesia are still centered on the island of Java and then followed by the island of Sumatra. Likewise, the largest GRDP's inequality occurs on Java Island, however the inter-island GRDP imbalance is also very apparent from the average GRDP value of each island. In

addition, the biggest difference of Human Development Index (HDI) occurred on the island of Sulawesi with a difference of 3.07.

Table 4.1. : Descriptive Statistics of Research Data Several Islands in Indonesia 2013-2018

	GRDP (trillion Rp)	Gov. Exp (trillion Rp)	HDI	Worker (people)	Investment (trillion Rp)
Sumatra					
Mean	2,012.2	56.59	69.74	24,687,815	99.3
Median	2,003.0	53.75	69.74	24,585,953	102.9
Min	1,811.0	47.75	68.36	23,094,040	64.3
Max	2,229.5	68.05	71.18	26,569,652	127.9
Std. Dv	154.8	8.89	1.06	1,337,608	26.0
Java					
Mean	5,423.9	127.08	72.75	67,586,020	337.5
Median	5,398.8	125.27	72.79	66,676,502	321.6
Min	4,716.4	93.97	71.30	65,997,749	277.7
Max	6,192.8	165.17	74.19	70,653,052	423.8
Std. Dv	551.8	27.29	1.10	1,980,258	58.0
Kalimantan					
Mean	809.4	24.63	69.36	7,251,732	77.6
Median	800.0	24.28	69.33	7,267,799	74.3
Min	755.9	22.83	68.02	6,976,747	62.5
Max	875.9	27.67	70.79	7,611,234	100.6
Std. Dv	43.6	1.80	1.02	236,564	13.9
Sulawesi					
Mean	545.8	18.43	67.65	8,187,833	42.5
Median	544.5	17.94	67.61	8,135,724	43.1
Min	454.1	13.00	66.16	7,582,727	21.9
Max	643.3	23.77	69.23	8,703,976	57.2
Std. Dv	71.6	4.38	1.15	443,195	14.6
Bali, Maluku and Papua					
Mean	514.6	34.55	65.09	9,978,071	47.9
Median	519.7	35.58	65.01	10,064,686	48.2
Min	440.5	24.28	63.65	9,355,474	32.3
Max	585.1	41.73	66.70	10,467,036	58.9
Std. Dv	55.9	6.93	1.15	444,836	10.2

4.2. Panel Data Result

Panel data regression has three standard estimation models, namely: Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). The Chow and Hausman test was used in order to choose the best regression model with the results are follows:

4.2.1 Chow and Hausman Test Result

Chow test is used to decide the best model between Common Effect Model (CEM) and Fixed Effect Model (FEM). While Hausman test is used to decide the best model between Fixed Effect Model (FEM) and Random Effect Model (REM). That model test has the null hypothesis as below:

Chow test	**Hausman Test**
H_0: CEM is preferred	H_0: REM is preferred
H_1: FEM is preferred	H_1: REM is preferred

This test is done by comparing the probability value with an alpha of 5%. If the probability value is greater than alpha, then accept H_0 and vice versa. The result of chow test and Hausman test calculation using Eviews are concluded as follow:

Table 4.2 : Chow Test

Effects Test	Statistic	d.f	Prob
Cross-section F	1275.656077	(33,166)	0.0000
Cross-section Chi-square	1130.092929	33	0.0000

Source:Secondary data processed with Eviews 8, 2019

From the results of the Chow Test above it can be seen that the Chi-square statistic is 1275.656077 with a probability of 0.0000 which is significant in alpha 5%, which means that H_0 is rejected and accepts H_1, then the most appropriate model to use is Fixed Effect Model (FEM).

Table 4.3 : Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Prob
Cross-section random	101.130931	4	0.0000

Source:Secondary data processed with Eviews 8, 2019

From the Hausman test results above it can be seen that the Chi-square statistic of 101.130931 with a probability of 0.0000 which is significant in the alpha of 5%, which means that H_0 is rejected and accepts H_1, then the most appropriate model to use is the Fixed Effect Models (FEM).

4.2.2 Fixed Effect Result

Fixed Effect Model (FEM) assumed there are different effects between individuals (Provinces), which intercept is not constant and constant-coefficient.

Table 4.4 : Fixed Effect Model

Variabel		Coefficient	Std. Error	t-Statistic	Prob
C		4.79624	0.7866	6.09743	0.0009
log (Gov Exp)		0.02467	0.009	2.745	0.0067
HDI		0.07575	0.00336	22.5689	0.1253
log (Worker)		0.10102	0.06557	1.54062	0.001
log (Investment)		0.01355	0.00341	3.97704	0.001
Fixed effect (cross)					
Aceh	-0.2172	Ja-Teng	1.48307	Sul-Ut	-0.6703
Sum-Ut	1.00314	DIY	-1.1347	Sul-teng	-0.2632
Sum-Bar	-0.0383	Ja-Tim	1.99832	Sul-Sel	0.5367
Riau	1.00085	Banten	0.77207	Sul-gara	-0.5167
Jambi	-0.048	Bali	-0.3771	Gorontalo	-1.3638
Sum-Sel	0.67327	NTB	-0.208	Sul- Bar	-1.0378
Bengkulu	-1.1566	NTT	-0.3678	Maluku	-1.3899
Lampung	0.47391	Kal-Bar	0.07035	Maluku Utara	-1.475
Kep. Ba-Bel	-0.9253	Kal-Teng	-0.4508	Papua Barat	-0.2607
Kep. Riau	-0.1198	Kal-Sel	-0.1541	Papua	0.84614
DKI	1.45132	Kal-Tim	0.76517		
Ja-Bar	1.84905	Kal-Ut	-0.7482		
Cross-section fixed (dummy variables)					
R-squared		0.99956	Mean depend var		11.8058
Adjusted R-squared		0.99946	S.D dependent var		1.15426
S.E. of regression		0.02684	Akaike info criterion		-4.2313
Sum sq. resid		0.1196	Schwarz crite		-3.6132
Log likelihood		469.595	Hannan-Quinn crite		-3.9813
F-statistic		10141.5	Durbin- wWaton stat		0.91761
Prob (F-stati)		0			

Source:Secondary data processed with Eviews 8, 2019

Based on Table 4.4 the Constanta value is 4.79, it means the dependent variable (GRDP) is 4.79 percent if the independent variable is valued at zero. R-squared value of 0.999558, it means the change in the dependent variable that can be

explained by the independent variable is 99.95%. The F-statistic value is 10141.47 with a prob (F-statistic) of 0.0000 which means that the independent variables simultaneously influence the dependent variable. Based on the t-statistic in this model if using alpha 5%, then only worker does not have a significant influence on GRDP in Indonesia 2013-2018.

Since, the FEM assumes that there are different intercepts for each individual. The intercept similarities for each province could be different if there is no independent variable. Maluku Utara is the province with the lowest GRDP with total intercepts 3.32 percent, while the highest GRDP is East Java Province with an intercept value of 6.78 percent on the total GRDP that province in certain period .

4.3. Hypothesis Testing

After selecting the regression model and getting Fixed Effect Models to be the most appropriate model to use, the next step is to explain the test of the hypothesis as follows:

4.3.1 Coefficient of Determinant (R^2)

Coefficient of Determinant (R^2) measures the percentage of the total variation of the dependent variable that can be explained by the independent variable in the regression model. Hence, we can know the level of appropriateness of the estimation model that is formed (goodness of fit). In Table 4.4 as the appropriate model showed coefficients determination (R^2) generated by the model is 0.999558. It means variable GRDP as dependent variable is explained by government expenditure (X_1), HDI (X_2), worker (X_3) and investment (X_4) by 99,95 % as the

independent variable. While the other outside variables which described the model is 0,05% as residual.

4.3.2 t-Statistic test

The t-test in Table 4.4 as the best model shown the level of significance of the effect of each independent variable (government expenditure, HDI, worker, and investment) on the dependent variable (GRDP). We assumed the null hypothesis (H_0) by $\beta_i = 0$ whereindicates thereis no influence of independent variable towards dependent variable. Besides, the alternative hypothesis (H_1) is $\beta_i \neq 0$ where indicates there is an influence of independent towards dependent variable. The result of test can be known by comparing either t-test and t-critical or t-probability and alpha. In this research, the observer use $\alpha = 0.05$is when the value of t-test > t critical or the value of the probability $t < \alpha = 0.05$ then H_0 will be rejected.

The conclusion of t-test results is:

A. t-statistic test of hypothesis on Government expenditure

H_o: $\beta_1 \leq 0$

H_1: $\beta_1 > 0$

Government expenditure (X_1) has the probability result 0.0067 or lower than α 5%; it rejects H_0, which means there is a significant effect of the government expenditure towards GRDP in Indonesia 2013-2018. In addition, coefifcient 0.024671 concluded that the increase in government expenditure will increase GRDP simultaneously. In conclusion, when the government expenditure increased

by 1 percent, the number of provincial GRDP in Indonesia will increase by 0,024 percent.

B. t-statistic test of hypothesis on Human Development Index (HDI)

H_0: $\beta_1 \leq 0$

H_1: $\beta_1 > 0$

HDI (X_2) has the probability result 0.0067 or less than α 5%; it rejects H_0, which means there is a significant effect of HDI towards GRDP in Indonesia 2013-2018. In addition, with a regression coefficient of 0,075 which means that when HDI rises 1 percent, the number of provincial GRDP in Indonesia will experience an increase of 0,075 percent.

C. t-statistic test of hypothesis on Worker

H_0: $\beta_1 \leq 0$

H_1: $\beta_1 > 0$

Worker (X_3) has the probability result 0.1253 or bigger than α 5% and 10%; it rejects H_0, which means there is no significant effect of worker on GRDP in Indonesia 2013-2018. It can be concluded that the increase in worker will not have a serious impact on GRDP.

D. t-statistic test of hypothesis on investment

H_0: $\beta_1 \leq 0$

H_1: $\beta_1 > 0$

Investment (X_4) has the probability result of 0.001 or less than α 5%; it accepts H_0, which means there is a significant effect of the investment on GRDP in

Indonesia 2013-2018. In addition, with a regression coefficient of 0.013549 which means that when the investment goes up by 1 percent, the total GDP of the Province in Indonesia will increase by 0,013 percent.

4.3.3 F- Statistic test

F test is used to evaluate whether all independent variables influence simultaneously against the dependent variable or not. As a conclusion, it will describe the simultaneous effect of independent variables on dependent variable. F-Statistic test is found by comparing the probability value with alpha or F-statistic and F-critical. In this study, researcher using $\alpha = 0,05$. Hence, when the value of F-statistic > F-critical or if the value of the probability $F < \alpha = 0.05$ then H_0 will be rejected.

The test results in table 4.7 F-statistics are 10141.47 by showing the F-statistic probability of 0.0000 <0.05 then the conclusion H_0 is rejected.Thus, the government expenditure, HDI, worker, and investment variables contained in the regression equation simultaneously have an impact on GRDP at $\alpha = 5\%$.

Therefore, it can be concluded that the best regression equation model as below:

$$\boldsymbol{log(GRDP) = -11.75 + \beta_1\, log(Gov) + 5.11\, log(HDI) + 0.10\, log(Worker) + 0.01\, log(Investment) + e_{it}} \quad \text{.....(4.1)}$$

4.4. Discussion

A. Government Expenditure

The researchresultsare similar with the first hypothesis which states that government expenditure has a significant positive effect toward regional income. These results are supported and similar to previous studies including Wardana, et al. (2014); Fitri (2016); Maisaroh and Risyanto (2016). Government Expenditure aims to finance regional needs is very influential on Gross Regional Domestic Product (GRDP) because the expenditure will be used for public interests such as employment expenditure, goods and services expenditure, and capital expenditure, which will support economic activities in the production goods and services. As a result, Gross Regional Domestic Product (GRDP) in a region will increase.

B. Human Development Index (HDI)

Based on the results obtained in the study, the probability of HDI t-statistic is 0.0000. It means the quality of human capital which measured from HDI significantly affects the GRDP in Indonesia. It is in line with the null hypothesis that increasing human capital will increase GRDP simultaneously. As comparison to other independent variables, human capital is the factor with the greatest impact on GRDP. Besides, the coefficient of human capital is 0.075, it means the increasing of 1 percent of the capital investment will increase by 0,075 percent no doubt the impact of human resources is very high on GRDP because the human capital employed in an organization is the key thinker, planning and driving force to achieve targets as well as the efficiency of an area. As has been found by Izzah

(2015); Irmayanti (2017); and Rahmawati (2013) in their study which stated a very strong relationship between HDI and national/regional income.

C. Worker

Based on the results of research that has been done, the results of the study differ from the first hypothesis which states that government expenditure has a significant positive effect. The researcher found that that workers have no significant effect on regional income in Indonesia. Even though, from the point of view of the production process the existence of worker is one of the inputs or factors of production but this result might be happened as explained by Bloom, et al. (2003) explains that although basically workers and population can affect the income of a country or region, the population and the number of workers can be neutral; once other factors such as country size, openness to trade, educational attainment of the population, and the quality of civil and political institutions are taken into account. Futhermore, Karlita, and Yusuf (2013) explained this result could occur because of the low productivity of workers; as result, even the numbers are many but not significantly affect GRDP.

D. Investment

With an investment t-statistic probability value of 0.0001 indicating a significant relationship between investment and GRDP, coupled with a positive t-statistic (3.977042) indicates that the relationship is positive An increase in the realization of investment will have a positive direct effect on national income. The significant positive relationship occurs because when being used makes an investment, there is a certain amount of capital invested or issued. Hence, there

are a number of purchases of goods and services that are not consumed but used for production either the present or future. As researched by Pratama (2011) and Putra (2018) who found the results of the study that investment is very influential on the growth of regional Gross Regional Domestic Product (GRDP) and they also argued that investment is one component of aggregate expenditure, therefore an increase in investment will increase aggregate demand, national income and job opportunities.